

ACNET and Shot Setup

- **ACNET**

- navigation, plotting data,
recording downtime

Phillip Koehn

- **Shot Setup**

- Terminology & Overview
- Checklist & flowchart

Ace Training
April 9th 2003

ACNET

- What is ACNET ?
- How to start/run ACNET.
- Navigating in ACNET.
- Plotting data in ACNET.
- Downtime logger

What is ACNET ?

- Accelerator Network
- Developed by the FNAL Controls Group
- Monitor information throughout the accelerator
 - Beam currents
 - Luminosity
 - Losses
- Separate devices for Tevatron, Main Injector, experiments

Starting ACNET

- ACNET runs on PC on the West side of the Control Room - rack 2RR03G
- Should already be running
- Automatically starts after reboot
- If it crashes or is unresponsive, do this get it going again:

- **START**

- Programs
- Acnet
- Cnsrun

3 sets of 5 windows

- PA - Primary Applications
- PA: Touch Panel
- GxSA - Secondary Applications
- GxPA:1 - Graphics Window
- GxPA:2 - Graphics Window

3 Groups - A, B, C

Additional Utilities Window

Primary Applications Window

E		EXPERIMENT-RELATED PROGRAMS	◆Cmnds◆◆Pgm_Tools◆
1		24 UNUSED PARAM PAGE	47 SILICON-PARAMETERS
2		25 UNUSED PARAM PAGE	48 SVX TEST BARREL
3		26 UNUSED PARAM PAGE	49 CMP/CMX LV
4	CDF ALARMS MONITOR	27 UNUSED PARAM PAGE	50 VTX/CTC LV&TEM
5	ALARMS STARTER	28 GAMMA HI VOLTAGES	51
6	ALARM ENABLE	29 UNUSED PARAM PAGE	52 UNUSED PARAM PAGE
7		30 UNUSED PARAM PAGE	53 UNUSED PARAM PAGE
8	CDF DOWNTIME LOG	31 UNUSED PARAM PAGE	54 UNUSED PARAM PAGE
9	EXAMINE DATABASE	32 UNUSED PARAM PAGE	55
10	DEVICE LIST I/O	33 UNUSED PARAM PAGE	56 FORWARD GAS FLOW
11	E-Z WRITER	34	57
12	UNIGNORE ALARMS	35 DO SMI LOSS MON.	58 DZERO PARAMETERS
13		36 UNUSED PARAM PAGE	59 ELECTRON COOLING
14	UNUSED PARAM PAGE	37 UNUSED PARAM PAGE	60 VTX PARAMETERS
15	UNUSED PARAM PAGE	38 UNUSED PARAM PAGE	61
16		39 UNUSED PARAM PAGE	62 B0 BACKGROUNDS
17	MONITOR	40 FMU & RPOT PISA	63 RADMON
18	ELECTRON COOL/NEF	41 E868 APEX PARAMS	64 MON STORE
19	ELECTRON COOL VAC	42 E811 PARAMETERS	65 CMP,CMX,CMU (PC1)
20	SVX LOSS MONITOR	43 CSX PISA SCINTILL	66 RPOT, FMU (PC2)
21	EXPORT MANAGER	44 E864 MINIMAX	67 FIH,PIH,FCM,PCM P3
22		45 E811 COMMANDER	68 CTC (PC4)
23	SHOW UPDATE TIMES	46 E811 ALARM DOWNLD	69 CES,CCR,CPR (PC5)

Navigating in ACNET

- You will type wherever the cursor is.
- Move the cursor over the character where you want to type.
- Left mouse button works like "return".
- On index page, either click on the page number, or type in Top Left Corner.
- To get back to the index page, type letter of desired index page in the Top Left Corner.

Many Index Pages

B - Booster

C - Collider

D - Diagnostic/Utility

E - Experimental

I - Main Injector

L - Linac

P - PBar

R - Recycler

T - Tevatron

Some Useful and Essential Pages

- C65 Collider Luminosity
- D44 Lumberjack Plotter
- E8 Downtime Data Logger
- E11 E-Z Writer - great for making livetime plots
- E20 SVX Loss Monitor
- E48 Silicon Alarms/Aborts
- E64 Monitor Store

C65 - Collider Luminosity

```

C65  LUMINOSITY/LOSS TOTALS          SET      D/A      A/D      Com-U  ◆COPIES◆
-<FTP>+ *SA◆ X-A/D  X=TIME          Y=C:B0SOLI,T:ERING ,C:B0Q5 ,T:IBEAMS
COMMAND ----- Eng-U  I= 0          I= 0          , 0          , 0
-< 1>+ One+ EV_DB  F= 500          F= 100000 , 1000 , 2000 , 100

```

```

C:B0PLOS      B0 Proton Losses              0      Hz
C:B0ALOS      B0 Antiproton Losses           0      Hz
C:B0ILUM      B0 Luminosity                  0      E30
C:B0TLUM      B0 Integrated Luminosity       5440   nb-1
C:B0LLUM      B0 Live Luminosity             0      E30
C:B0TLIV      B0 Live Luminosity Total       .001   nb-1
C:B0C13       Tight Min Bias Trigger         0      Hz
I:STORE       Present Store Number          56/    56/

```

!D0FLTL AND D0FZTL ARE EQUIVALENT (MDC 4/25/01)

```

C:D0FLTL      D0 total Fast Z Lum           0      0      0      E30
C:D0FZTL      D0 total Fast Z Lum           0      0      0      E30
C:D0PHTL      D0 total prot bunch           .282   .141   .141   Hz
C:D0AHTL      D0 total pbar bunch           .563   .563   .563   Hz

-C:FBIPNG     TFBI Prot NaroGate Inten      0      0      1E09
C:FBIANNG     TFBI Pbar NaroGate Inten      0      0      1E09

```


E11 - E Z Writer

E11

E-Z Writer

◆Pgm_Tools◆

*SA◆ X-A/D X=TIME Y=C:BOILUM,C:BOILLUM,C:BOTLUM,C:BOTLIV
 ---- Eng-U I= 0 I= 0 , 0 , 50 , 0
 One+ EV_DB F= 300 F= 5 , 5 , 300 , 300

mr loss tev loss TEV LUM cmuo svx
 up down strange charm bottom
 e nue mu numu tau

TIME	Y=C:BOILUM,C:BOILLUM,C:BOTLUM,C:BOTLIV			
0	I=	0	0	50
300	F=	5	5	300
TIME	Y=C:LOSTP ,T:ERING ,C:B0Q5 ,T:IBEAMS			
0	I=	0	0	0
300	F=	100000	1000	2000
TIME	Y=T:IBEAMS,C:BOILUM,C:B0Q5 ,T:ERING			
0	I=	0	0	0
300	F=	50	2	2000

D 77 S 67 M 77 T102 L 67 P 73 B 67 T107 M 78 C 67

Messages

Important quantities to Monitor/Plot in ACNET

Losses

C:BOPLOS, C:LOSTP - B0 proton losses
C:BOALOS, C:LOSTPB- B0 anti-proton losses
C:BOPBSM - Proton Abort gap rate
C:BOABSM - Anti-Proton abort gap rate
C:BORAT4 - Abort gap gated losses in CMP

Tevatron

T:ERING - Tevatron energy
T:L1COLI - Tevatron Electron Lens Current
T:RFSUM - Tev RF current
T:SBDMS - Avg. Longitudinal Bunch Length
T:RFSUMA - Anti-Proton RF Sum

Luminosity

C:BOILUM - B0 instantaneous luminosity
C:BOLLUM - Live instantaneous luminosity
C:BOTLUM - Integrated luminosity
C:BOTLIV - Live integrated luminosity
C:BOQ5 - Current in B0 quads

SVX

E:SVRAD(0-3)
E:SVBLA(0,1), SVBLB(0,1)

www-cdfonline.fnal.gov/acnet/acnetplots.html
www-cdfonline.fnal.gov/acnet/definitions.html

Plotting Data

Two ways to plot

- Real-time plots
 - Fast-time plotter
 - Accessible from E-Z Writer
 - Accessible from top left corner of most pages
- Plots of stored data
 - Lumberjack data logger
 - Plot from page D44
 - Devices listed on page D43
 - X = Time, Y = Device

Real time plotting

E11

E-Z Writer

◆Pgm_Tools◆

*SA◆ X-A/D X=TIME Y=E:SVRAD0,E:SVRAD1,E:SVRAD2,E:SVRAD3
 ---- Eng-U I= 0 I= 0, 0.0, 0, 0
 One+ EV_DB F= 300 F= 5, 5, 5, 5

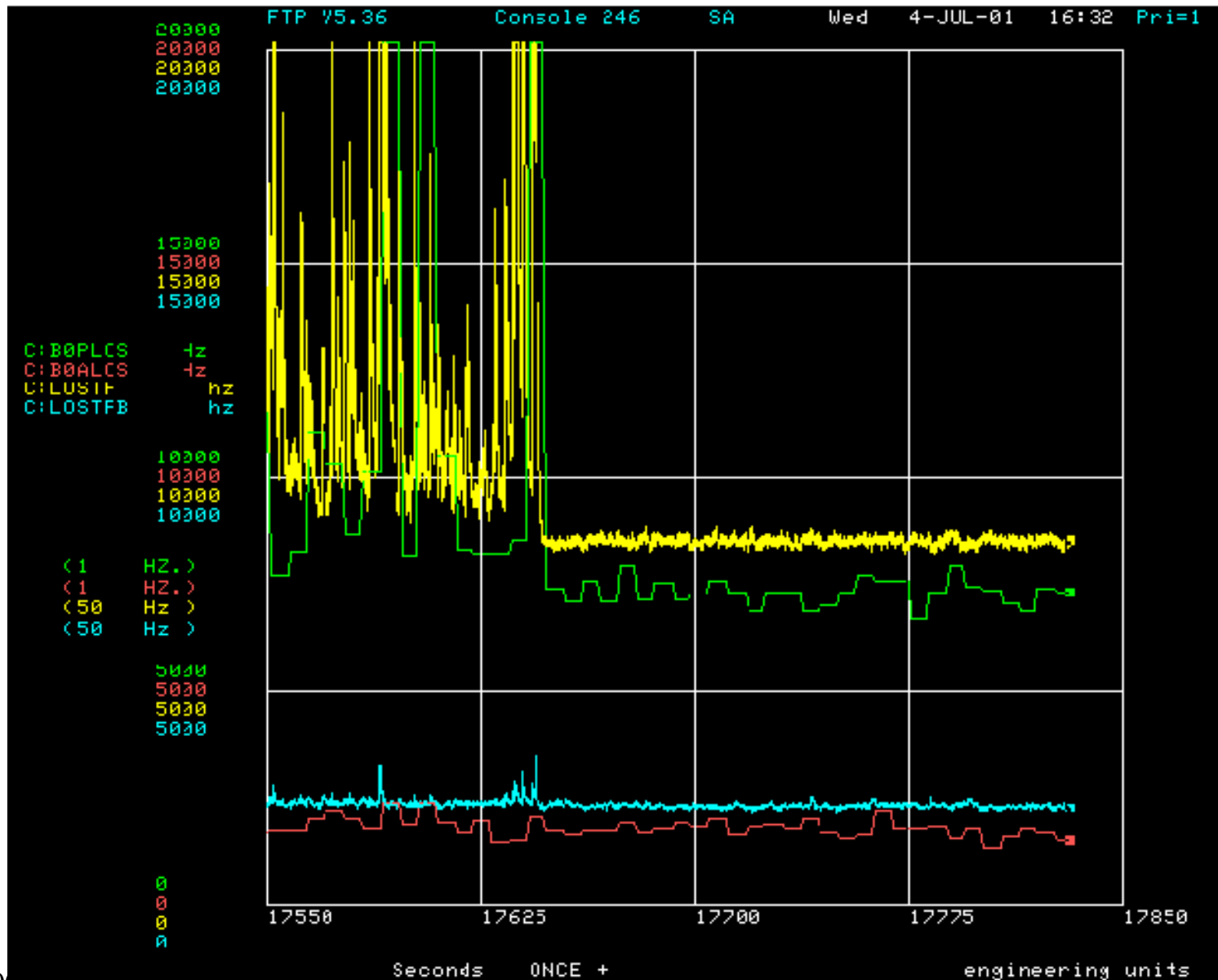
mr loss tev loss tev lum cmuo SVX
 up down strange charm bottom
 e nue mu numu tau

TIME	Y=E:SVRAD0,E:SVRAD1,E:SVRAD2,E:SVRAD3			
0	I=	0,	0.0,	0, 0
300	F=	5,	5,	5, 5
TIME	Y=E:SVBLA1,E:SVBLA2,E:SVBLB1,E:SVBLB2			
0	I=	0,	0,	0, 0
60	F=	.01,	.01,	.01, .01
TIME	Y=T:BOLMV1,T:BOLMV2,T:BOLMAA			
0	I=	1.5,	1.5,	45000,
60	F=	2.5,	2.5,	55000,

D 77 S 67 M 77 T102 L 67 P 73 B 67 T107 M 78 C 67

Messages

Real time plotting



Plots of stored data

D44: Lumberjack Datalogger

```

D44  Lumberjack Datalogger
Plot Title = ♦Shift Summary Luminosity
X=TIME      Y=C:BOILUM ,C:BOILLUM ,C:BOTLIV ,C:BOTLUM ,
I= 0        , 0          , 0          , 0          ,
F= 250      , 150       , 250       , 7000      ,
.CDF        .CDF        .CDF        .CDF
NONE        NONE        NONE        NONE
10082       10082       10082       10931
10082       10082       10082       10931
Read
Plotted

Y=
I= 0        , 0          , -10         , -10
F= 5000     , 1          , 10          , 10
.CDF        .Ctrl      .Ctrl      .Mau
NONE        NONE        NONE        NONE
Read
Plotted

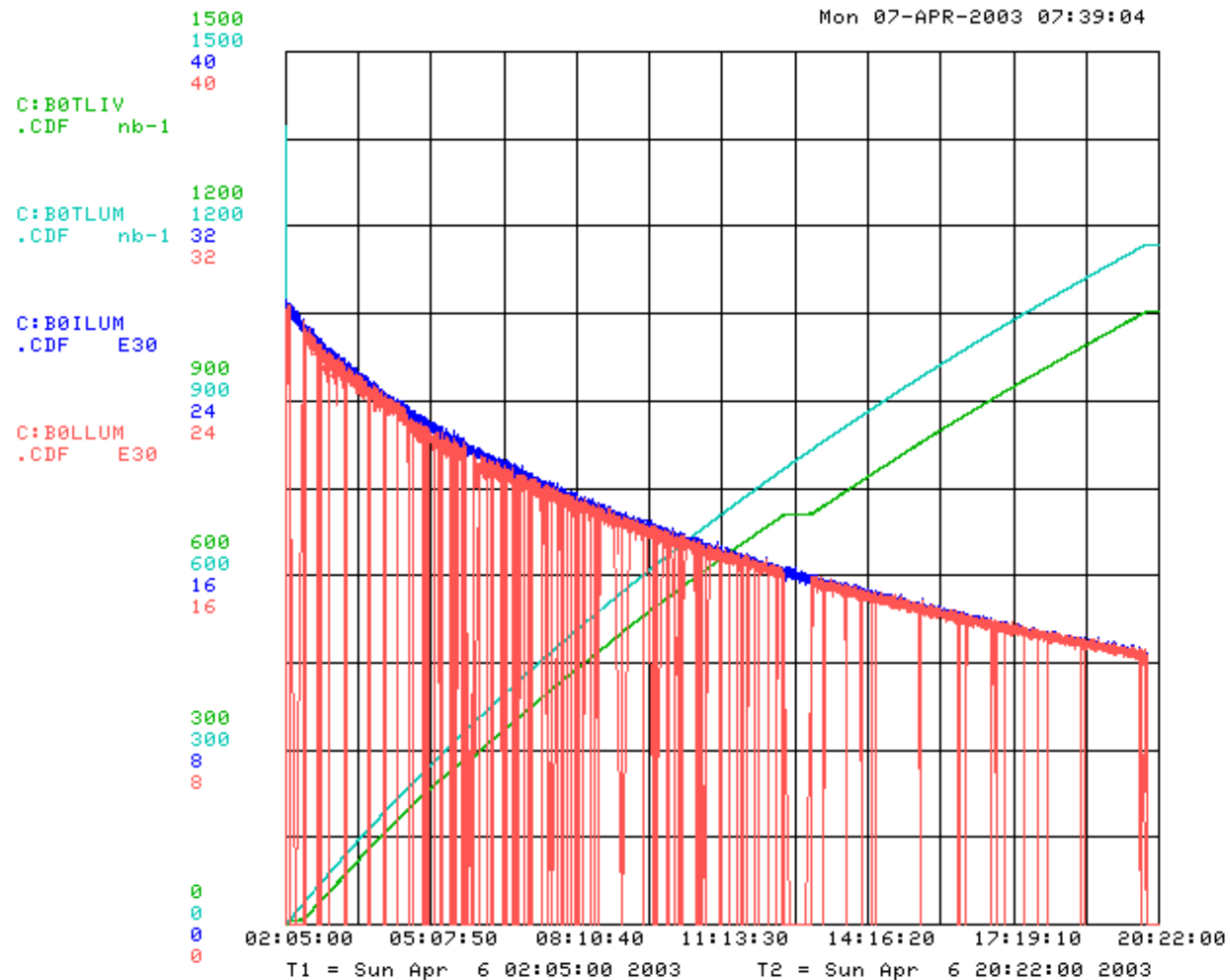
I1= Mon 02-JUL-2001 00:00  I2= Mon 09-JUL-2001 00:00  ♦Inc♦ ♦I2 Now♦ ♦Interval♦
♦Skip♦      ♦X Divs 12♦    ♦Interpolation♦    ♦Integrate♦    ♦Editor♦
♦Trace♦     ♦Y Divs 10♦    ♦Previous♦    ♦Next♦    ♦Average♦    ♦Fold♦
♦Symbol♦    ♦Overwrite♦    ♦Recall♦     ♦Save♦    ♦StdDev♦    ♦LJScanJob♦
♦List Data♦ ♦Copy♦    ♦Fit Equations♦
Data Source ♦CDF (Cns45)♦
♦All Device Plot♦List = ♦ 3♦    ♦Export Data♦♦Enable♦♦Calc Points♦

Messages
CNS 246, node=48, record # 32 - saved
CNS 246, node=48, record # 31 recalled
CNS 246, node=48, - console restored
1:3 of 5

```

Plots of stored data

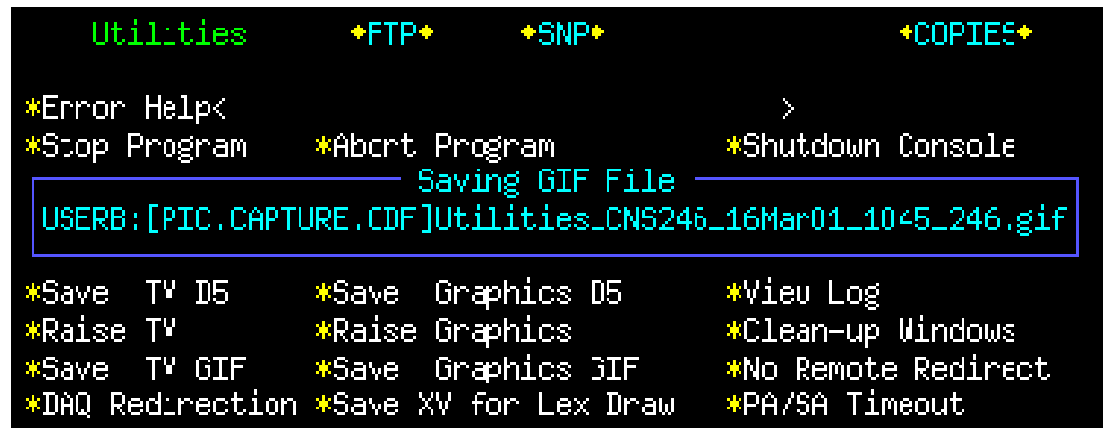
D44: Lumberjack Datalogger



End of shift summary

Want summary of luminosity, svx rads in e-log

- Should have lumberjack plots already formatted
- Use **RECALL** to bring up saved format
- Save file to disk (save as gif)
 - Use utilities window



```
Utilities      *FTP*      *SNP*      *COPIES*

*Error Help<                                     >
*Stop Program      *Abort Program      *Shutdown Console

Saving GIF File
USERB:[PIC.CAPTURE.CDF]Utilities_CNS246_16Mar01_1045_246.gif

*Save TV D5      *Save Graphics D5      *View Log
*Raise TV      *Raise Graphics      *Clean-up Windows
*Save TV GIF      *Save Graphics GIF      *No Remote Redirect
*DAQ Redirection *Save XV for Lex Draw      *PA/SA Timeout
```

- Save to gif
- Save in **[PIC.CAPTURE.CDF]**
- Import to e-log

Page E8 - CDF Downtime data Logger

- When data-taking stops for more than 2 minutes, an entry is generated automatically.
- Shift crew must edit to categorize downtime
 - HV
 - DAQ
 - Trigger
 - Level3
 - etc, etc
- Downtime logger category names
 - www-cdfonline.fnal.gov/acnet/downtime_names.html
- Allows for downtime accounting later

Page E8 - CDF Downtime data Logger

F8 Downtime Log Entry And Edit. Pgm Tools

◆Command◆ ◆Auto Entry◆ ◆Statistics◆ ◆Plot◆ ◆Manager Functions◆

-<28-OCT-2001>+ 28-OCT-01 08:48:19

◆Mail◆ Down Time Log ◆Find◆

Dn	Up	System	Mode	Description of Problem
06-OCT-2001 Saturday				
0527	0531	TEVSTUD	H	flying wire
0558	0613	TRIGLVL2	H	12 studies
0614	0623	TRIGLVL2	H	12 studies
0627	0632	TEVSTUD	H	flying wire
0647	0656	TRIGLVL2	H	12 studies
0659	0703	TRIGLVL2	H	12 studies
0705	0715	NOCATEG	H	b0svx07 gave BT0
0727	0731	TEVSTUD	H	flying wire
1247	1251	TEVSTUD	H	flying wire
2255	2305	SCRAPERS	H	scraping
2307	2311	SCRAPERS	H	scraping
2347	2352	TEVSTUD	H	flying wire
07-OCT-2001 Sunday				
0035	0039	DAQ0THR	H	busy timeout
0048	0053	TEVSTUD	H	flying wire
0058	0102	COT HV	H	COT trip in SL7
=>0115	0145	FEVME	H	fib03 problem followed by CMP HV setting change

90:106 of 106

Messages

Click AUTO ENTRY to bring up pending entries

F8 Downtime Log Entry And Edit. Pgm Tools

◆Command◆ ◆Auto Entry◆ ◆Statistics◆ ◆Plot◆ ◆Manager Functions◆

-<28-OCT-2001>+ 28-OCT-01 08:48:46

◆Mail◆ Down Time Log ◆Find◆

Dn	Up	System Mode	Description of Problem
06-OCT-2001 Saturday			
0527	0531	TEVSTUD	H flying wire
0558	0613	TRIGLVL2	H 12 studies
0614	0623	TRIGLVL2	H 12 studies
0627	0632	TEVSTUD	H flying wire
0647	0656	TRIGLVL2	H 12 studies
0659	0703	TRIGLVL	
0705	0715	NOCATEG	
0727	0731	TEVSTUD	
1247	1251	TEVSTUD	
2255	2305	SCRAPER	
2307	2311	SCRAPERS	H scraping
2347	2352	TEVSTUD	H flying wire
07-OCT-2001 Sunday			
0035	0039	DAQ0THR	H busy timeout
0048	0053	TEVSTUD	H flying wire
0058	0102	COT HV	H COT trip in SL7
=>0115	0145	FEVME	H fib03 problem followed by CMP HV setting change

Recorded DT

◆Add◆ ◆Delete◆ ◆Quit◆

Down Time Up Time

11-OCT-2001 09:14 11-OCT-2001 10:10

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Messages

Click ADD and choose an entry from the list

F8 Downtime Log Entry And Edit. Pgm Tools

Command Auto Entry Statistics Plot Manager Functions

Save Now Pend New Entry Quit

down:11-OCT-2001 0914 up:11-OCT-2001 1010 Downtime <PENDING> Name_Help 6

Dn	Up	System	Mode	Description of Problem
06-OCT-2001 Saturday				
0527	0531	TEVSTUD	H	flying wire
0558	0613	TRIGLVL2	H	12 studies
0614	0623	TRIGLVL2	H	12 studies
0627	0632	TEVSTUD	H	flying wire
0647	0656	TRIGLVL2	H	12 studies
0659	0703	TRIGLVL2	H	12 studies
0705	0715	NOCATEG	H	b0svx07 gave BT0
0727	0731	TEVSTUD	H	flying wire
1247	1251	TEVSTUD	H	flying wire
2255	2305	SCRAPERS	H	scraping
2307	2311	SCRAPERS	H	scraping
2347	2352	TEVSTUD	H	flying wire
07-OCT-2001 Sunday				
0035	0039	DAQOTHR	H	busy timeout
0048	0053	TEVSTUD	H	flying wire
0058	0102	COT HV	H	COT trip in SL7
=>0115	0145	FEVME	H	fib03 problem followed by CMP HV setting change

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Messages

Click NAME HELP to list the major categories.
Click on category to get a list of subcategories.

F8 Downtime Log Entry And Edit. Pgm Tools

◆Command◆ ◆Auto Entry◆ ◆Statistics◆ ◆Plot◆ ◆Manager Functions◆

◆Save◆ ◆Now◆ ◆Pend◆ New Entry ◆Quit◆

down:11-OCT-2001 0914 up:11-OCT-2001 1010 Downtime < >◆Name_Help◆ 6

Dn	Up	System Mode	Description of Problem
06-OCT-2001		Saturday	
0527	0531	TEVSTUD	H flying wire
0558	061		Pick a group please...
0614	062	ACCELERATOR	
0627	063	DATA ACQUISITION	
0647	065	GAS PROBLEMS	
0659	070	HIGH VOLTAGE	
0705	071	MAGNETS	
0727	073	OPERATION	
1247	125	TRIGGER	
2255	230	CALIBRATION	
2307	231	MISCELLANEOUS	
2347	235	COMMENTS	
07-OCT-200		TESTS	
0035	003		
0048	0053	TEVSTUD	H flying wire
0058	0102	COT HV	H COT trip in SL7
=>0115	0145	FEVME	H fib03 problem followed by CMP HV setting change

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Messages

Possible categories under ACCELERATOR.
Click on one to copy it to the DOWNTIME field.

F8 Downtime Log Entry And Edit. Pgm Tools

◆Command◆ ◆Auto Entry◆ ◆Statistics◆ ◆Plot◆ ◆Manager Functions◆

◆Save◆ ◆Now◆ ◆Pend◆ New Entry ◆Quit◆

down:11-OCT-2001 0914 up:11-OCT-2001 1010 Downtime < >◆Name_Help◆ 6

Dn	Up	System Mode	Description of Problem
06-OCT-2001		Saturday	
0527	0531	TEVSTUD	H flying wire
0558	061		Pick a group please...
0614	062	ACCELERATOR	
0627	063	DATA ACQUISITION	
06		ACCEL	
06		MRLOSS	main ring losses
07		TEVLOSS	tevatron losses
07		SCRAPERS	waiting for stable beam
12		TEVSTUD	Tevatron Studies
22			
2307	231	MISCELLANEOUS	
234/	235	COMMENTS	
07-OCT-200		TESTS	
0035	003		
0048	0053	TEVSTUD	H flying wire
0058	0102	COT HV	H COT trip in SL7
=>0115	0145	FEVME	H fib03 problem followed by CMP HV setting change

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Messages

Possible categories under HV.
Click on one to copy it to the DOWNTIME field.

F8 Downtime Log Entry And Edit. Pgm Tools

◆Command◆ ◆Auto Entry◆ ◆Statistics◆ ◆Plot◆ ◆Manager Functions◆

		HV
◆Sa	PEM HV	plug e-m high voltage
dow	PHA HV	plug hadron high voltage
	FEM HV	forward e-m high voltage
Dn	FHA HV	forward hadron high voltage
06-0	CES HV	central strip high voltage
05	VTPC HV	vertex TPC high voltage
05	CMU HV	central muon high voltage
06	CDT HV	central drift tubes high voltage
06	COT HV	central tracking chamber high voltage
06	FTC HV	forward tracking chamber high voltage
06	IMU HV	forward muon high voltage
07	ALL HV	turn on/off HV
07	SVX HV	silicon vertex detector voltage
12	CPR HV	central prevadiator high voltage
22	CMX HV	muon extension high voltage
23	CMP HV	central muon upgrade high voltage
23	HVCNTRL	HV control problems
07-0	CCAL HV	Central cal HV
00	PCAL HV	Plug cal HV
00	BMU HV	Barrel muon HV
00	ISL HV	Intermediate silicon HV
=>01	CLC HV	Luminosity counter HV
	BSC HV	Beam shower counter HV
	TOF HV	Time-of-flight HV

t 6
p
p
+

Type in comment then click SAVE to commit the new entry

F8 Downtime Log Entry And Edit. Pgm Tools

◆Command◆ ◆Auto Entry◆ ◆Statistics◆ ◆Plot◆ ◆Manager Functions◆

◆Save◆ ◆Now◆ ◆Pend◆ New Entry ◆Quit◆

down:11-OCT-2001 0914 up:11-OCT-2001 1010 Downtime <COT HV >◆Name_Help◆ 6

type the comment explaining the downtime here

Dn	Up	System Mode	Description of Problem
06-OCT-2001 Saturday			
0527	0531	TEVSTUD H	flying wire
0558	0613	TRIGLVL2 H	12 studies
0614	0623	TRIGLVL2 H	12 studies
0627	0632	TEVSTUD H	flying wire
0647	0656	TRIGLVL2 H	12 studies
0659	0703	TRIGLVL2 H	12 studies
0705	0715	NOCATEG H	b0svx07 gave BT0
0727	0731	TEVSTUD H	flying wire
1247	1251	TEVSTUD H	flying wire
2255	2305	SCRAPERS H	scraping
2307	2311	SCRAPERS H	scraping
2347	2352	TEVSTUD H	flying wire
07-OCT-2001 Sunday			
0035	0039	DAQOTHR H	busy timeout
0048	0053	TEVSTUD H	flying wire
0058	0102	COT HV H	COT trip in SL7
=>0115	0145	FEVME H	fib03 problem followed by CMP HV setting change

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Messages

When a new store goes in, enter as COMMENT.
Not an auto entry, so use ADD ENTRY

F8 Downtime Log Entry And Edit. Pgm Tools

◆Command◆ ◆Auto Entry◆ ◆Statistics◆ ◆Plot◆ ◆Manager Functions◆

◆Save◆ ◆Now◆ ◆Pend◆ ◆New Entry◆ ◆Quit◆

down:15-JAN-2002 1619 up:dd-mm-yyyy hhmm Downtime < >◆Name_Help◆ 1

Dn	Up	System	Mode	Description of Problem
14-JAN-2002		Monday		
2214	2217	CMU HV	H	PENDING
=>2222	225	Pick a group please...		
2341	234	ACCELERATOR		
2346	235	DATA ACQUISITION		
15-J		COMMENTS		
00	STORE	Store info. down = time at low beta. up = end store		
00	STORCOM	Store comments.		
00	STRSHFT	Start shift; crew list		
01	ENDSHFT	End shift; Cooplump, CDFlump, downtime, beantime		
=>02	NOTES	notes for record		
03				
0341	035	COMMENTS		
0424	042	TESTS		
0442	045			
0501	0505	HVCNTRL	H	cmp cmx trip
0505	0511	HVCNTRL	H	cmx trip
=>0613	0633	HVCNTRL	H	cmp cmx trip

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Messages

DOWN time is when scraping is complete (t_0 for start of the store). Fill the UP time at the end of store. COMMENT should include store # and initial luminosity.

F8 Downtime Log Entry And Edit. Pgm Tools

Command Auto Entry Statistics Plot Manager Functions

Save Now Pend New Entry Quit

down:15-JAN-2002 1619 up:dd-mm-yyyy hhmm Downtime <STORE >Name_Help 1

Store 999 - initial lum 1.5E31

Dn	Up	System Mode	Description of Problem
14-JAN-2002 Monday			
2214	2217	CMU HV H	PENDING
=>2222	2255	NOCATEG H	
2341	2345	CMU HV H	
2346	2356	TRIGLVL2 H L2 Done	timeout
15-JAN-2002 Tuesday			
0012	0018	HVCNTRL H	cmp,cmx trip
0025	0029	HVCNTRL H	CMX, CMP trips
0031	0050	HVCNTRL H	CMX, CMP trips due to high losses
0103	0120	STARTUP H	starting new run
=>0237	0259	STARTUP H	starting new run in order to include muon
0319	0330	HVCNTRL H	CMP CMX trip
0341	0351	STARTUP H	starting new run in order to include silicon
0424	0429	HVCNTRL H	cmx cmp trip
0442	0452	STARTUP H	new run startup
0501	0505	HVCNTRL H	cmp cmx trip
0505	0511	HVCNTRL H	cmx trip
=>0613	0633	HVCNTRL H	cmp cmx trip

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Messages

ACNET resources

<http://www-cdfonline.fnal.gov/acnet/acnet.html>

Web Tutorials by John Yoh, et al.

- www-cdfonline.fnal.gov/acnet/acnetplots.html
- 4 *fresh and exciting* tutorials.

Aces' Shift ACNET Plots

- www-cdfonline.fnal.gov/acnetplots/acnet.html -

Accelerator Division Web Pages

- www-bd.fnal.gov/acnet/
- Information about all acnet pages

Shift crew resources:

- Bug your overlap ACE buddy, operations manager, JJ, and Steve Hahn !

Shot Setup

- Terminology
- Overview
- Checklist

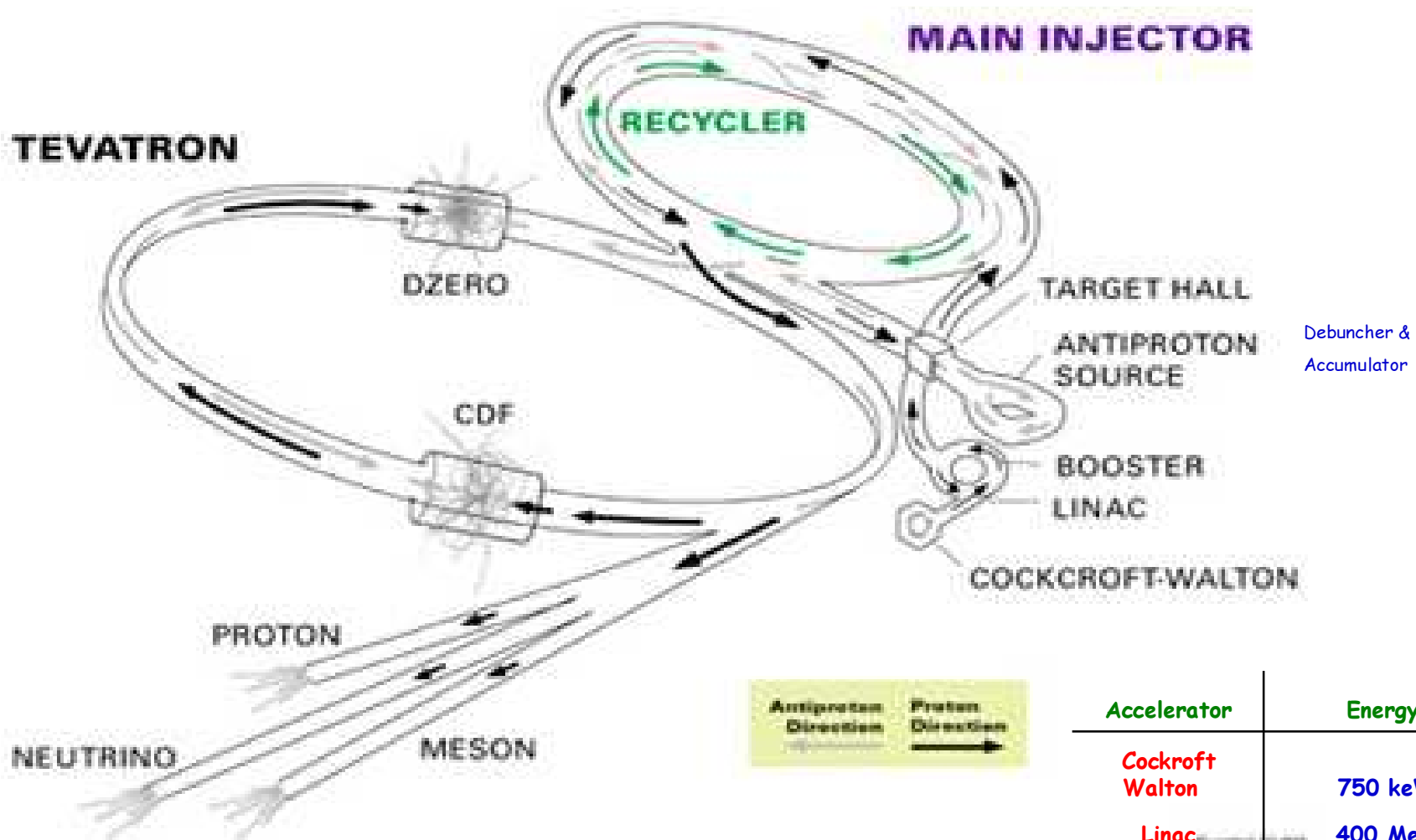
Shot Setup Terminology

- **Store** - when there is a steady particle beam present in the Tevatron
 - Usually with both protons and anti protons
 - Numbered sequentially
 - Can last from minutes to hours to days
 - Can sometimes end abruptly

Shot Setup Terminology

- **Shot** - the injection of antiprotons from the Accumulator into the Main Injector and on into the Tevatron in preparation for colliding beams operation.
- **Shot Setup** - the sequence of events leading to antiproton shots.

The Accelerator Chain



Accelerator	Energy
Cockroft Walton	750 keV
Linac	400 MeV
Booster	8 GeV
Main injector	150 GeV
TEVATRON	980 GeV

Shot Setup Overview

- At the end of the previous store:
 - Finish data taking run
 - Before the previous store is dumped, ramp down high voltage (allow 5 minutes)
 - The Main Control Room (MCR) should notify CDF in advance of planned beam dumps.

Shot Setup Overview

- Between one store and the next:
 - Assume sufficient pbars to go again(>100mA)
 - Time between shots:
 - ~2-3 hours if things are going well
 - Beams Division goal is 1 hour
 - Calibrations (Quiet time ?)

Shot Setup Overview

- Beginning of the next store:
 - Protons are injected first, then pbars
 - Accelerate beams to 980 GeV
 - Cogging
 - Low Beta Squeeze
 - Scraping
- Once losses are low and the beam is stable, Ramp the HV and begin taking data

Shot Setup Overview

- **Injection** - the process of transferring protons or antiprotons from the Main Injector to the Tevatron (4 bunches at a time)
- **Ramping** - the magnetic fields of the magnets are increased simultaneously, boosting proton/pbar energies from 150 GeV to 980 GeV ("flattop")

Shot Setup Overview

- **cogging** - the process of spacing the bunches of protons or pbars in the TeVatron so that they collide at the proper points in the ring.
- **low beta squeeze** - after injecting protons and pbars into the TeVatron, a special set of quadrupoles are turned on at B0 to reduce the size of the beam and increase luminosity.
- **scrapping** - using collimators to remove the beam "halo" and reduce losses.
 - MCR will notify CDF when scrapping is complete, but you should be monitoring the ACNET variable **T:VSCRAP** too !

What to watch in ACNET

When the shot is going in...

C:BOPLOS BO proton losses from BSC (Hz)

C:BOALOS BO pbar losses from BSC (Hz)

C:LOSTP - proton losses fast response (Hz)

C:LOSTPB- pbar losses fast response (Hz)

C:BOILUM - BO delivered instantaneous luminosity ($E30 \text{ cm}^{-2} \text{ s}^{-1}$)

C:BOQ5 - Current in low beta quads (Amps)

T:ERING - Tevatron energy (GeV)

T:IBEAM - Tevatron beam current (E12)

E:SVRAD(0-3) - SVX integrated radiation dose (rad)

E:SVBLA(0,1), SVBLB(0,1) - SVX instantaneous rates (rad/s)

Andy Hocker will talk about Silicon radiation monitoring in Thursday's training session.

During the store also monitor...

C:BOILUM - Delivered instantaneous luminosity ($E30 \text{ cm}^{-2} \text{ s}^{-1}$)

C:BOLLUM - Live instantaneous luminosity ($E30 \text{ cm}^{-2} \text{ s}^{-1}$)

C:BOTLUM - Integrated delivered luminosity (nb^{-1})

C:BOTLIV - integrated live luminosity(nb^{-1})

What to watch in ACNET

To measure losses in silicon detectors

E:SVRADO - west inner BLM integrated radiation dose (rad)

E:SVRAD1 - west outer BLM integrated radiation dose (rad)

E:SVRAD2 - east inner BLM integrated radiation dose (rad)

E:SVRAD3 - east outer BLM integrated radiation dose (rad)

E:SVBLA1 - west inner BLM instantaneous loss rate (rad/s)

E:SVBLA2 - west outer BLM instantaneous loss rate (rad/s)

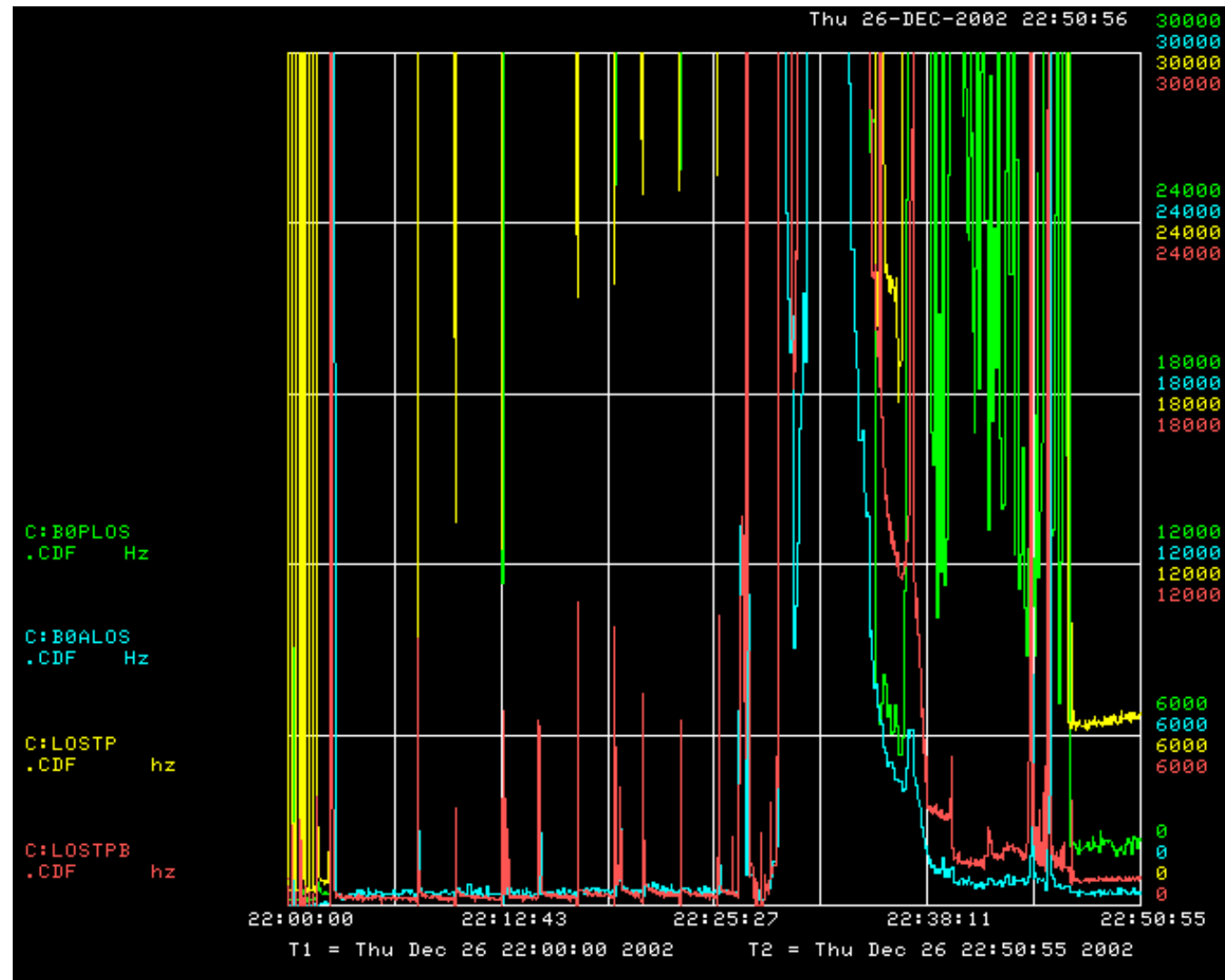
E:SVBLB1 - east inner BLM instantaneous loss rate (rad/s)

E:SVBLB2 - east outer BLM instantaneous loss rate (rad/s)

Acnet page E20 allows you to monitor the current values of the instantaneous and integrated dose rates

Store 2105: losses during shot setup (ACNET page E11 E-Z writer)

C:B0PLOS
C:B0ALOS
C:LOSTP
C:LOSTPB



Store 2105: losses during shot setup (owl shift elog)

2002.12.26 21:59:19 E Outer BLM 3.70 RADS

Integrated dosage - Hirokazu Kobayashi

-- Thu Dec 26 22:05:24 comment by...Hiro -- All proton bunches have loaded. And anti-proton bunches are loading.

Thu Dec 26 22:30:11 Run 155816 TERMINATE: TeV at flattop. - Vivek

Thu Dec 26 22:31:30 RC in IDLE state till scraping done to judge losses. - Vivek

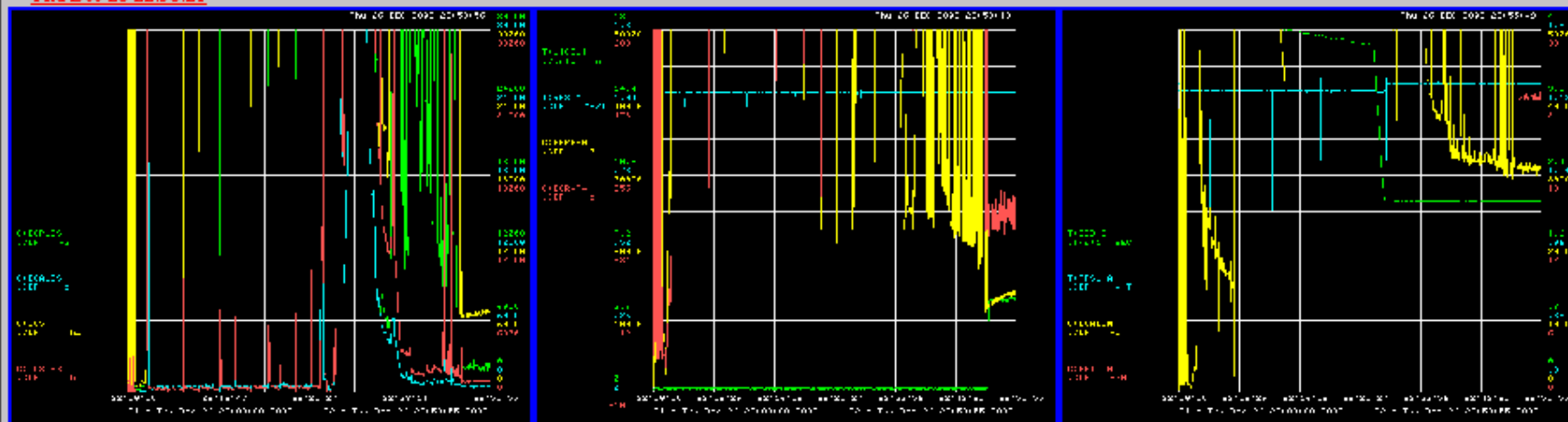
Thu Dec 26 22:51:16 Scraping was done at 22:47. - kondo

-- Thu Dec 26 22:55:59 comment by...kondo -- TeVPR=6617E9, TeVPB=623.7E9. Initial B0 Luminosity=24.7E30

-- Thu Dec 26 23:00:02 comment by...kondo -- B0PLOS=2.3kHz, B0PBLOS=400Hz.

-- Thu Dec 26 23:05:40 comment by...Hiro/Vivek -- CMX tripped. We could recovered it.

Thu Dec 26 22:58:21



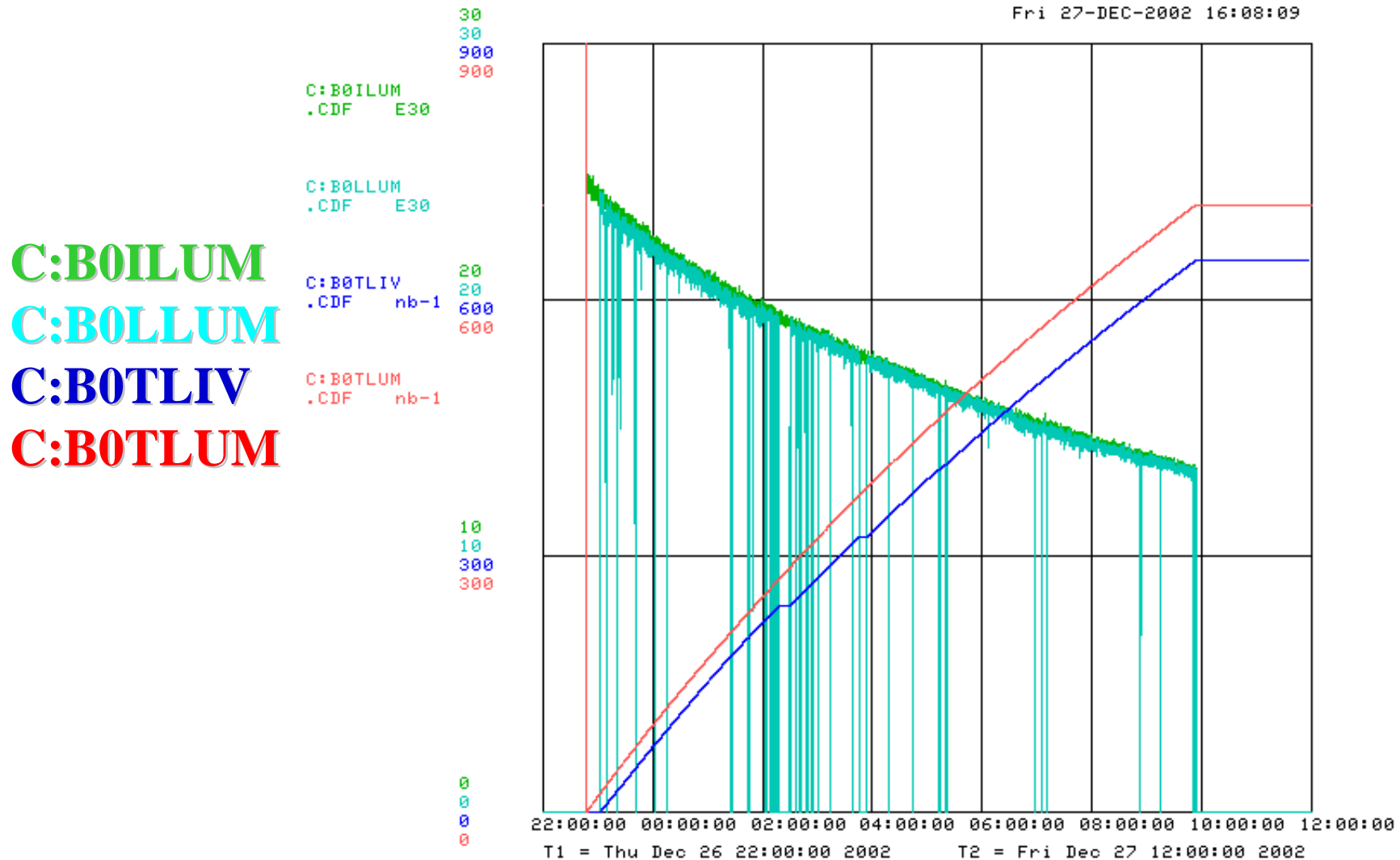
- Hirokazu Kobayashi

Thu Dec 26 23:00:02 Run 155818 Activated at 2002.12.26 22:59:50 - RunControl

Thu Dec 26 23:00:30 Run 155818 ACTIVATE: Start w/ silicon. - Vivek

Thu Dec 26 23:09:14 Started w/ silicon in 13 minutes from scraping done. But lost ~2 minutes due to successive done timeouts from b0musco0. Halted the run after trying HRRs and used "Reset, Reboot and Recover feature" of the run control to get back to data taking. - Vivek :: (run 155818)

Store 2105: luminosity during the store (ACNET page D44 Lumberjack plotter)



Shot setup checklist

www-cdfonline.fnal.gov/opshelp/ShotSetupChecklist_current.html

CDF Shot Setup Checklist v2.6

date _____ Store# _____

http://www-cdfonline.fnal.gov/opshelp/ShotSetupChecklist_v26.html
Revised 17 February-2003

Instructions:

- *Use this checklist during shot setup. File completed this form in a Shot Setup folder.
- *Record entries in the shift elog.
- *Recording times in the boxes is useful when communicating information during shift changes.

1) Before a store (Many steps can be performed simultaneously.)

- * time: _____ About 1 hour before shot setup begins, check that the solenoid is on, or ramping.
- * Check the solenoid field in rack 2RR06B in the control room (red digits). This should read ~ **13750** gauss (_____ gauss).
- * (b) Check the solenoid current on the IFIX terminal in the same rack. This should read **4650** amps(_____ amps).
If the solenoid is not on, call the Cryo Tech (x3632) and ask them to ramp the solenoid. It takes about 1 hour to ramp to full field.
- * time: _____ Check that the silicon radiation protection is active. On ACNET page E20, check that **Fifos Recording** is present. If not, page the silicon radiation monitoring expert (266-2713).
- * time: _____ Check that the HV is in the following configuration:
 - * **Off:** TOF, MNP, CLC
 - * **Standby:** COT, SVX*, ISL, L00, CMU, CMP, CMX, BMU, CES, CPR, CCR, PEM, PHA, PSB
 - * Raising silicon from off to standby is an EXPERT ONLY operation.
 - * **On:** CEM, CHA, WHA, GAM, BSC, RPS.
- * time: _____ Verify that the master clock is set to **NORMAL** run mode. The clock module is on the left-hand side of the bottom crate of rack 2RR22I in the trigger room. The green light for **NORMAL** run mode should be on. If the mode is incorrect, page the Operations Manager (314-4862).
Also, check that the Tevatron Beam Sync delay in ACnet is correct. This is parameter C:TEVSYN, which you can find listed on E64, Stores, subpage 2. The correct value is 0.881 MREV. If this is not the value, page the Operations Manager.
- * time: _____ Make sure that dynamic prescaling (**DPS**) is **ENABLED** in the scaler GUI.
* time: _____ Take a cosmic ray run with all working crates (**Run Number** _____)

April 9th, 2003

Philip Koehn OSU/CDF - Ace Training

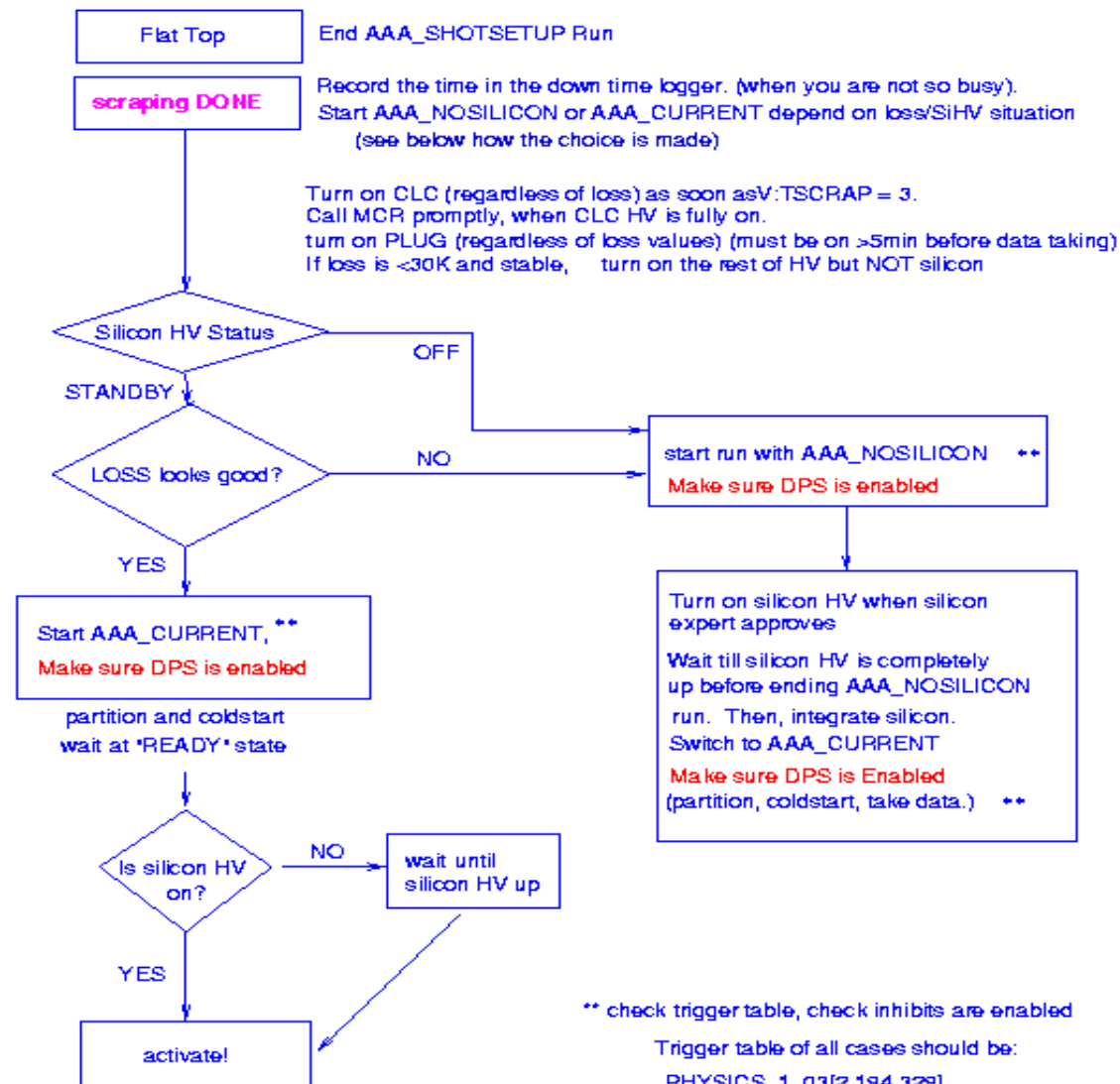
shotsetup flow chart (with Silicon)

* when antiproton loading starts, page silicon (218-8227)

* should be running AAA_SHOTSETUP run.

DPS (dynamic prescale) should be ENABLED for all physics runs.

Auto HRR should be ENABLED for all physics runs from the Error Handler GUI.



Last update: Dec. 13 2002, Kaon

Resources

Shot setup checklist:

www-cdfonline.fnal.gov/opshelp/ShotSetupChecklist_current.html

Shot setup flowchart:

www-cdfonline.fnal.gov/opshelp/shotsetup_flow.ps

Helpful Beams Info:

www-bdnew.fnal.gov/operations/rookie_books/rbooks.html

www-bd.fnal.gov/runII/index.html